The Excavating Engineer

Vol. 18 APRIL 1924 No. 4

The Magnet Hill Grade Reduction

Description of Walsh Construction Company's 700,000-yard Contract on the Illinois Central Railroad At Mattoon, Illinois — An Unusual Dragline Application.

OUR readers may possibly recall that *The Excavating Engineer* published in January, 1923, gave a description of an interesting contract involving the reduction of a heavy grade on the Illinois Central Railroad at Monee, Illinois, amounting to 800,000 yards of earth excavation, and entailing an enormous expenditure on the part of the Illinois Central Company.

At that time, it will be remembered, *The Excavating Engineer* called the attention of its readers to an interesting fact concerning that particular job — the fact that a dragline excavator was used in place of the time-honored combination of railroad-type shovel and dump cars.

The work at Monee, Illinois, encouraged no little amount of favorable comment, and the award to the Walsh Construction Co. of the contract described in this issue is due in no small measure to their success at Monee.

The work at Mattoon involves the same problem as that which confronted the Illinois Central at Monee. Lying just south of Mattoon, Illinois, about 174 miles south of Chicago on the Illinois Central Railroad, is Magnet Hill which has given that railroad a considerable amount of trouble in the matter of freight haulage. For a number of years in the past, it has not been at all uncommon to break up north-bound trains in order to get them across the grade.

Reduction of this hill has been contemplated for a number of years, and early in 1923 bids were invited, the Walsh Construction Company of Davenport, Iowa, having been awarded the contract on March 21, 1923.

Dragline Operations

The average grade on the south end of the cut amounted to 0.6%, with a maximum of 0.8%, and on the north end an average of 0.5%. These grades will be reduced by lowering the cut on the south end to .25%, raising fill on the south to 0.3%, and lowering the cut on the north end to .3%.

A Bucyrus Class-24 dragline excavator, the same machine that was used at Monee, is being used on this work. This dragline is equipped with a 75-foot boom with a 25-foot extension and a 5-cubic-yard bucket. In addition to this equipment, four Davenport locomotives, 41 twelve-yard Western dump cars, a Northwest ¾-yard gasoline shovel, a Jordan spreader and a clamshell excavator, which, as we are told, was a "home-made affair built from odds and ends," are being used.

The reduction is not being done under traffic, so that the usual traffic problem has been eliminated, the cut being taken 63 feet west of the present main line. The work covers a distance of 6.4 miles, of which 3.3 miles is excavation and 3.1 miles is fill. The deepest cut below natural ground is 30 feet, below present subgrade 24 feet, and the deepest center line fill is 30 feet.

When completed there will be 697,000 yards excavated from the cut, and 33,000 yards from a drainage ditch just west of the new fill. 705,000 yards of this excavation is used for fill, the rest being wasted.

The excavation is being done in one complete operation, which gives the work an advantage in that it is possible to lay the track directly in the wake of the dragline, and to divert the traffic from the old main line immediately after the completion of the excavation.

The dragline cut in on May 1, 1923, and from the beginning of the work has operated two ten-hour shifts per day. The output by month has been as follows:

	Cubic Yards		Cubic Yards
May	57,841	August	104,000
June	101,909	September	86,938
July	95,996	October	75,365

Figures for November, December and January were not available. The conditions of the weather during November were such that regular operation of the dragline was impossible. Heavy and constant rains left the dump in such a

View of Cut on North End of Magnet Hill Showing Dragline in Background

Drainage Ditch Cut Just West of the New Fill which Involved Approximately 35,000 Yards

North Along Trestle and Fill from Station at Aetna

View Showing False Work for Fill

Views of the Magnet Hill Operations

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softened condition that the dirt trains could not be worked. In December and January the coldest weather in seven years prevailed, which caused an almost constant shutdown.

The largest output in one double shift of ten hours each was on June 23, 1923, amounting to 4,774 yards. Water for use in the locomotives and

Bucyrus Class-24 Dragline Taking a Bucket Load

dragline was pumped from Paradise Reservoir, a distance of about two miles.

The material excavated consists of 60% hard blue clay, 10% common earth and 30% yellow clay. There is a considerable seepage of water between the blue and yellow clays and also between the yellow clay and earth. Although this water has caused some slides on the side of the cut, no great amount of trouble has been experienced.

The Same Machine Loading Into 12-Yard Western Dump Cars

At the time of writing this article the job was about 85% completed. If everything goes on as smoothly as expected, the work will be completed about the time this issue reaches our readers.

There is approximately 200,300 yards of concrete to be placed, which is also included in the Walsh contract. This work consists of a subway at Aetna, Illinois, two highway bridges, one 8-foot double arch, one 6-foot by 8-foot box, and three inverted siphons which carry small streams across and under Magnet cut. There will be four timber overhead bridges spanning the cut, which are being built by the Illinois Central Railroad.

The following men represent the Walsh Construction Company: William Durkin, General Superintendent; Dick Smith, Superintendent. The Illinois Central Engineers are: F. L. Thompson, Chief Engineer; E. L. Crugar, Engineer of Construction.

We are indebted to B. L. Kelso, Assistant Engineer in charge of the project, for this information.

Shovel Operation in an Ontario Cement Plant

Description of the Plant of the St. Mary's Cement Company at St. Mary's, Ontario, Where Two Railroad-Type and One Small Revolving Shovel Are in Operation

ABOUT twenty miles north of London, Ontario, in the district of Perth, lies the city of St. Mary's, one of the most beautiful and most prosperous towns in the industrial section of Ontario.

Here is situated the plant of the St. Mary's Cement Company, which has for a number of years been growing and prospering, and the big hole in the ground that they have made is a practical illustration of the extent of their activities.

This quarry produces upwards of 1000 cubic yards of rock a day, which finds its market throughout the province of Ontario.

Equipment Used

The St. Mary's Cement Company has in operation a Bucyrus 20-B shovel with crane attachment, and two railroad-type shovels, one of which is a Bucyrus 70-C and the other a 55-ton. In addition to this equipment they are using two clipper No. 4 electric drills, four Fate-Root-Heath gasoline locomotives, and a large number of 36-inch gauge, 5-yard Continental dump cars.

Quarry Operations

The quarry is a clean-cut proposition, with a well-defined working face, averaging 40 feet in thickness in all directions. The rock is hauled

The Bucyrus 20-B Equipped with Orange-Peel Bucket

55-Ton Bucyrus Shovel in the Foreground Showing a General View of the Quarry with the Drills on the Bank in the Distance

View Showing Rock Crusher at the Right with Mill and Dryers in the Background

The 70-C Bucyrus Loading Five-Yard Continental Dump Cars, Showing a Plymouth 36-inch Gauge Gasoline Locomotive Near the Shovel

Views of the St. Mary's Cement Company's Operations at St. Mary's, Ontario

The Rock Crusher, Showing the Mill and Dryers in the Background

over the clean and level floor with easy dispatch, and the tracks converge on an incline, where the material is hauled up to the crusher house by means of a hoist, and is dumped into the jaws of a 48-inch x 60-inch Traylor Jaw Crusher.

Although a greater portion of the output has heretofore been attributable to the Bucyrus 70-C, supplemental digging ability has been represented in the 55-ton Bucyrus shovels, a railroad-type shovel of an older and smaller design.

Small Revolving Shovel Purchased for the Work

Mr. J. G. Lind, the general manager of the company, has been looking forward to further development of their unusual quarry resources, and, with this in mind, he installed within the past year a small revolving shovel with crane attachment, to prepare the ground for still further extensions. One of our photgraphs shows the 20-B equipped with an orange-peel bucket, since the first work necessary in its career was the building of a half mile of canal, 15 feet deep and 20 feet wide, through a stiff clay and boulder formation.

This work was accomplished in quick time, and the 20-B rounded out its first season in handling clinkers at the cement mill, this material being used in the manufacture of cement.

Later on it is expected that this machine will be converted into a shovel to be used for removing the overburden which consists of five feet of heavy clay.

In looking over this plant, one is impressed with the remarkable team work displayed in every department, for the whole operation is like clock work from the time the first blast hole is fired to the loading of the finished product from the crushing plant.

The feeling one carries away with him from a visit to this plant is that of a perfect working organization, running like one big machine without noise or fuss, but grinding out the goods with regularity and precision.

Will Probe Milford Mine Disaster

Governor Preus of Minnesota, acting upon resolution adopted by the Federated Trades Assembly of Duluth, has appointed a committee to investigate the Milford mine disaster, on the Cuyuna Iron Range.

This mine was flooded by a sudden inrush of water on February 5th, and 41 miners were drowned.

The committee named by the governor is composed of W. E. McEwen, editor and publisher of the Labor World, of Duluth; Dwight E. Woodbridge, consulting engineer, Duluth; R. R. Bailey, president of the W. T. Bailey Lumber Co., Virginia, Minnesota; Edward Smith, St. Louis County mine inspector, Eveleth, Minnesota, and J. Wilbur Van Evera, Crosby, Minnesota.

The committee will meet and confer with the governor before organizing and planning the investigation.

On Thursday at noon the water in the Milford shaft was down to about 134 feet, and work progressing favorably. The first level is at 135 feet.

Bucyrus Company Moves New York Office

The Bucyrus Company moved their New York office on April first from their old location at 30 Church Street, to Rooms 1175 and 1176, 50 Church Street, New York City.

Stripping Mine-Run Coal in Western Pennsylvania

How the Firm of Bentz Brothers of Turtle Creek, Pennsylvania, Are Producing 15,000 Tons of Pittsburgh No. 8 Gas Coal with a 2½-yard Revolving Shovel on Caterpillars

COAL has been much in the public eye of recent years, and is a subject with which we are at least to some degree familiar, since it is one of the necessary commodities of the home, and one of the biggest cogs in the great wheel of commerce.

Open-cut coal mining as against the underground method is comparatively new, and its progress has grown with the development of the large revolving shovel.

A number of companies using this method have come into prominence in the past few years. One of the more recent operations to adopt stripping methods, a company which we feel will sooner or later push itself to the foreground, is the firm of Bentz Brothers of Turtle Creek, Pennsylvania.

The property of Bentz Brothers is a 600-acre tract of undulating land, a short distance from Turtle Creek, ten miles southeast of Pittsburgh on the Union Railroad.

For removing the overburden Bentz Bros. have a Bucyrus 80-B shovel, equipped with a 2½-cubic-yard bucket and a 42½-foot boom and mounted on caterpillars. This shovel is the largest type of revolving shovel mounted on caterpillars, and is designed for work which does not require a larger machine but which has sufficient range to carry deep cuts. Its caterpillar feature gives it great mobility in the pit, which saves considerable time in moving up and backing away from blasts.

The overburden consists for the most part of a sandy shale averaging in thickness about 20 feet, with a maximum of 45 feet in some places, which requires a great deal of blasting. Two Sanderson Cyclone gasoline drills are kept constantly at work drilling ahead of the operations. These machines drill 5-inch holes, each hole covering an area of between 15 and 30 square feet. The method of blasting used is that of drilling into the roof coal and springing the hole three times with ten sticks of 40% dynamite. The hole is then loaded with ten cans of black powder, which results in a most satisfactory blast.

The method of stripping is that of making a complete cut around the outcrop, and closing in toward the center of the property with a cut 35 feet in width.

The 80-B shovel is ideally suited to this operation. The depth of the overburden is not too great for its range, and its caterpillar traction is of great advantage. Mr. Frank Bentz says in regard to the caterpillars: "The same advantage of caterpillars is found in this type of shovel as in the small revolving shovel, and moving about is the least of our troubles. The caterpillars have paid for themselves many times over."

The shovel is worked on three eight-hour shifts. It is equipped with a Cleveland Recorder, which registers operating and lost time.

The Coal

The loading is handled by an Osgood small revolving shovel, which follows directly behind the 80-B. The coal is high grade and runs in a stratum of about six and a half feet in thickness. There is no intersection of fireclay, limestone, or even of slate, and it breaks up well for the shovel. It is known as the Pittsburgh No. 8 gas coal, and is transported directly from the shovel to the main line of the Union Railroad for distribution. The fleet of trucks, consisting of eight 5-ton Whites, hauls the coal over a bridge which spans the main line at a point about three-quarters of a mile from the pit and dumps directly into the cars. Later on, a coal tipple and washing plant will be installed, and the trucks will be replaced by dump cars.

Part of the camp equipment — the Recreation Car. The lady in the white dress is Mrs. Agnes Bentz, the "Commander-in-Chief."

It might be of interest to our readers to know that Bentz Brothers have a camp outfit, which, as Mr. F. J. Bentz says, is the "most complete camp equipment on wheels in the world." The outfit consists of two employees' sleeping cars, one dining car and one recreation car for employees, two official sleeping cars, one official dining car, one office car, one machine shop car, one blacksmith car, one mule car, one tool car, one feed car. All of these cars were designed and built by Bentz Brothers at a cost of eleven hundred dollars each. They are built on strong truck chasses, and all are equipped with electric lights.

The photograph of part of the outfit shown here was taken en route from Akron, Ohio, to Detroit, Michigan.

When Bentz Brothers moved to the territory in which they are at present operating, they

Stripping with Bucyrus 80-B shovel. This machine is equipped with a 42½-foot boom and a 2½-cubic-yard dipper. The smaller machine loading in the foreground is an Osgood. Drilling operations may be seen going on in the background. The machine shown is a Cyclone gasoline drill.

"The only complete camp equipment on wheels in the world," says Mr. Frank Bentz. The photograph was taken on a trip from Akron, Ohio, to Detroit, Michigan. The outfit consists of four sleeping cars, a recreation car, two dining cars, an office car, a machine shop car, a blacksmith car, one mule car, one tool car and one feed car, all of which are "home-made."

began their operations with three small revolving shovels. Later on, however, they began to feel the need of larger machinery and they purchased a Bucyrus 80-B. They have recently purchased a still larger machine, a Bucyrus 175-B equipped with a 75-foot boom and a 4-cubic-yard dipper.

The work is more or less a family affair, being managed by four of the Bentz Brothers, while the business is handled by two of the Bentz sisters. Mrs. Agnes Bentz, the mother, who may be seen in two of the photographs, is the commander-in-chief. The headquarters' office of the company is at Columbus, Ohio.

Mr. Frank J. Bentz is superintendent, while the shovel operators on the job are Jack Reed, John Farmer, Mick Rankin, H. O. Whitman, Jack McLaughlin and Sam Elliott.

How to Figure Horse and Truck Costs

By P. L. Sniffin

Success or failure in the operation of motor trucks depends very largely on knowing what truck operation costs. Most unsuccessful attempts to use motor trucks have been the result of haphazard guesswork in installing the vehicles, and an inaccurate knowledge of the cost factors on the part of purchasers has had much to do with this.

There is, for example, a common tendency, when considering the motor truck in comparison with horses, to figure only the visible costs such as fuel, oil, tires, driver's salary, garage, etc., and to neglect the very important items of fixed charges, such as depreciation, interest on investment, and insurance which form a very large percentage of the complete cost.

Here is a complete authoritative list of costs which must be included for horses and trucks:

Cost Items in Horse-Drawn Equipment

Fixed Charges

Interest on Investment. Compute the complete cost of equipment, including horses, wagons, harness and blankets. Figure half-current rate of interest on total sum, usually 3%, as an annual fixed charge, since the item of depreciation constantly reduces the amount of investment.

Depreciation. First ascertain the estimated life of the equipment, preferably in years. Most authorities place the estimated life of a horse at 5 years; of wagons at 10 years; and of harness at 5 years. Thus the yearly depreciation charge would be 20% for the horses; 10% for the wagons, and 20% for the harness. Depreciation must be figured on every part of the equipment.

Insurance. Whether or not insurance policies are carried for fire, theft and liability, a reserve should be built up to cover this risk. Where a policy is carried, it is a simple matter to charge the annual premium against the equipment. If a policy is not carried, find out what the premium would be, charge it against the equipment, and place it in a reserve.

Licenses, Taxes, Etc. Any fixed items of expense levied upon the equipment, either by law or by local ordinance comes under this head and must be considered as an expense against the vehicle.

Maintenance Charges

Stable Expense. If stable is rented, charge full rent, and any expense incurred in housing or storing both horses and wagons. If stable is owned, compute the total investment, and charge interest on this at 3% a year as above; figure depreciation on complete stable equipment (usually around 5%). Insurance, taxes, heating, lighting, water and stable help are also a part of this charge. An allowance for alterations and repairs to stable equipment should also be made.

Upkeep and Repairs. Repairs and painting for wagons, harness repair, shoeing and veterinary expense come under this head.

Running Charges

Equipment Expense. If wagons are rented, compute this cost in full as a running charge. Include under "running charges" the items of hay, oats, miscellaneous feed, etc., bedding, and such sundry expenses as axle grease, harness oil, sponges, soap, kerosene for lamps, etc.

Drivers' Salaries and Commissions. This item is self-explanatory and is charged (including bonuses or any special payment plans) usually as a running expense.

Cost Items in Gasoline Motor Truck Equipment

Fixed Charges

Interest on Investment. Same as for horses except investment is considered in gross less tires. Allow 3 per cent a year for this item.

Depreciation. The rate of depreciation figured for trucks depends upon the make and size of trucks. Many concerns consider the life of very light gas cars at three years and so charge depreciation at 33-1/3 per cent. On a good quality gas truck, that is operated under good running conditions, may well be depreciated at 15% a year, although it may be said that most authorities recommend 20% as a conservative figure.

Insurance. Same as for horses.

Licenses, Taxes, Etc. Same as for horses.

Maintenance Charges

Garage Expense. The complete rental charge for garage facilities, or the total annual expense involved in operating a private garage, is included in this item. Interest on the garage investment, including land, building and equipment at 3 per

cent yearly, depreciation at 5 per cent yearly, insurance, taxes, heat, light and water are the costs to be figured, and, in addition to this, a reserve must be set aside to take care of alterations and improvements to be anticipated.

Upkeep and Repairs. Repair costs, either estimated in advance or based on actual experience, together with mechanics' wages, painting and similar maintenance charges, are computed here.

Running Charges

Fuel. The cost of gasoline is a running charge to be included in the above classification.

Oil and Grease. Lubrication materials are likewise figured here.

Sundry Supplies. Kerosene, waste, soap, water, rags and sponges comprise this running cost item.

Battery Expense. Storage battery recharging and attention (where battery systems are used).

Tires. The per-mile cost of tires, including repairs, is included here on a yearly basis.

Drivers' Salaries and Commissions. This item is computed for trucks in the same manner as for horses.

Of course, it must be understood, in addition to the above, that costs must be considered in relation to the amount of work any given vehicle can accomplish in a specific amount of time. For example, it can easily be seen that one motor truck will do as much work as a considerably greater number of horses, depending upon the conditions met. Some concerns believe that a motor truck can cover as much ground as four or five single horse outfits.

It has been assumed by some people that the accident at the Milford mine, Cuyuna range, where 41 miners perished February 5th, would cause an advance in the rates for workmen's compensation insurance in Minnesota. Inquiry of one leading agency discloses that the disaster has had no such effect. Rates are quoted as usual.

NOTICE!

The Excavating Engineer Index for 1923

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You use Portland cement many times a day, go into buildings made largely of it, walk on sidewalks of cement concrete, cross concrete bridges, ride under rivers in concrete subways — to mention only a few of the possible uses. And you never think of its giving you anything but the best of service.

This is the highest sort of confidence — confidence that you scarcely even think of. It is due to a very great extent, of course, to the care and skill of engineers and contractors who have built the structures you know, but also back of that it is due to a half century of the most painstaking chemical and physical testing in the mills where the cement is made.

Few products require as great care in their manufacture as Portland cement, and few get it so uniformly.

The raw materials have their first test while they are still in the ground. Samples are taken at frequent intervals as the drills go down for the blasting. They are brought into the plant laboratories, and the essential ingredients determined, in typical instances, to an accuracy of one ten-thousandth of a gram. There are 454 grams in a pound.

The mixing of the materials is governed carefully by this test, and when the mixing has taken place it is checked as to its correctness by two further chemical tests, made not less than once an hour from samples taken every few seconds. Any adjustment shown necessary is made.

At every important stage of the manufacturing process — when the raw materials have been pulverized, when they have been burned to clinkers, when the clinkers are being ground — similarly accurate control is exercised.

Finally, when the burned material has been pulverized to finished cement, it is subjected to eleven further chemical and physical tests, all made at frequent intervals. The important ones are repeated on samples taken just before each car is shipped. These final tests are in the following five classes:

1. For fineness. Not less than 78 per cent of representative samples must sift through sieves with 40,000 holes to the square inch.
2. For strength.
3. For soundness, or constancy of volume.
4. For setting time.
5. For freedom from impurities.

These qualifications are all covered by the exacting specifications of the American Society for Testing Materials and the United States Government — specifications which members of this Association helped to establish.

A handful of the finished product taken at random — any handful of the close to twenty million tons of cement produced annually — must meet these specifications at every point, before the cement goes out to the user.

In a medium-sized plant, one employing say 200 men, six men are constantly engaged on testing.

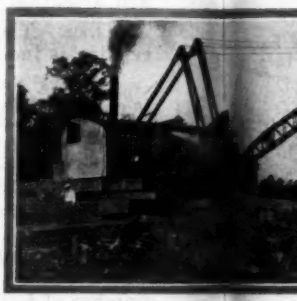
Their work and the accuracy it compels throughout the manufacturing process are important elements in the making of cement. This means that the cement you buy is dependable.

Roads to Stay

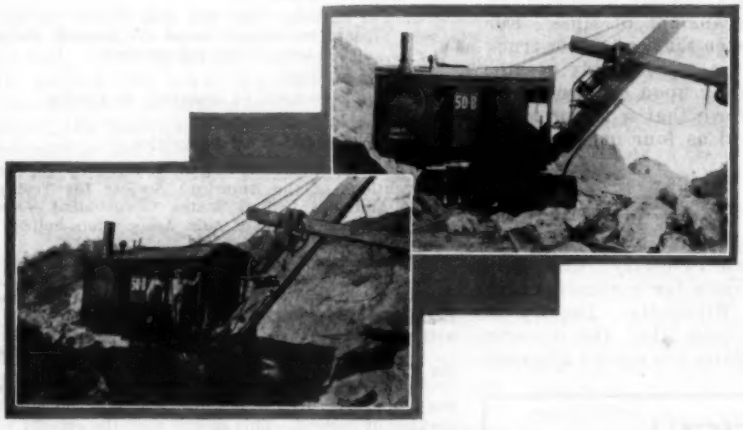
Hordes of trucks now remind us
We should build our roads to stay,
And departing leave behind us
Kind the rains don't wash away.
When our children pay the mortgage
Father's made to haul their loads,
They'll not have to ask the question,
"Here's the bonds, but where's the roads?"

— *Melton, Dallas.*

The Marquette Ore Company have recently purchased a set of caterpillars for their Bucyrus 88-C railroad-type shovel, which is shown in their Moroco Mine at Ironton, Minnesota. When these views were taken, the machine was operating under severe conditions, the bottom of the pit being very wet and spongy, as the accumulation of the mud on the links indicate. It can be readily understood how track troubles may be eliminated, and mobility made easy by the installation of caterpillars under railroad-type shovels.



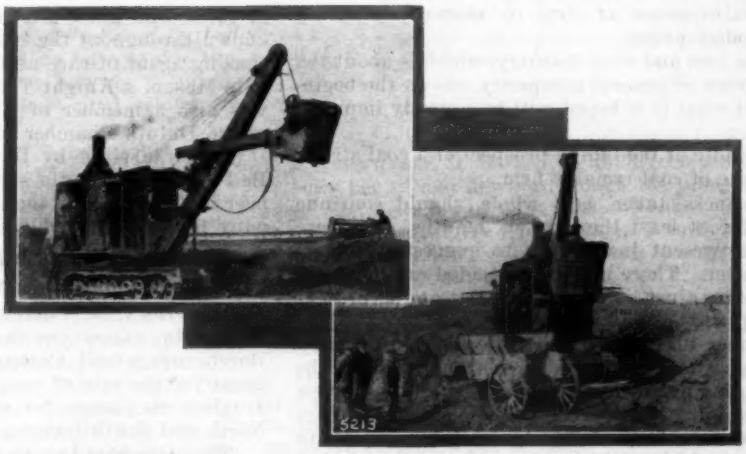
A Bucyrus Class-24 dragline with 100-
3½-yard bucket, owned by Fred
Indianapolis, in operation on a large
Gibson and Pike Counties, Indiana.
known as D. C. Houchins et al ditch.
straightening what is known as Patoh
river had a course of 43 miles. When
is completed next year it will amount
There is a total of 3,675,000 cubic yard
The upper end is being loaded by a
dredge, and the lower end amountin
yards was completed by the above dra
in August last. The ditch has a 60-fo
one slope, and an average depth of 20 f
photograph was taken, however, at a p
base was 80 feet and the pit 19 feet d



These views were taken near Riverside, California, where the Riverside Portland Cement Company have recently installed a new Bucyrus 50-B shovel. The man standing on the running board at the right is Mr. H. M. Russell, Superintendent.

The American Crushed Rock Company have recently installed a Bucyrus 50-B shovel in their plant at Claremont near Los Angeles, California. The machine is shown in the above views. They have in operation, in addition to their 50-B, a Bucyrus 30-B Diesel shovel, which was formerly owned by E. Schelling, a contractor also of Los Angeles. Mr. H. C. Chenowith is superintendent of the operations.

ith 100-foot boom and Fred C. Morgan of large drainage job in diana. This work is l ditch. The work is n Patoka River. This . When the new ditch amount to 17⅗ miles. bic yards on this work. ld by a 4-yard dipper mounting to 1,500,000 ove dragline excavator a 60-foot base, one to of 20 feet. The above , at a point where the feet deep.



The above views were taken at the Nash Motors Company plant at Kenosha, Wisconsin, where large loading docks with several spurs from the Chicago & Northwestern Railroad and the North Shore Lines are being built. The machine shown is a Bucyrus 20-B shovel owned by C. F. Wussow, Milwaukee, Wisconsin, who had the contract for the grading. In addition to the shovel equipment, three Fordson tractors and eleven teams were used to do the hauling. The man at the levers is Leander Hansen, the operator, while the man on the running board is his brother Joseph, the fireman. C. F. Wussow is in the center of the group of three standing.

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THE EXCAVATING ENGINEER PUBLISHING CO.

Bradlee Van Brunt, Manager and Editor

South Milwaukee, Wisconsin

Printed in the U. S. A.

The Business Outlook

There has been but little change in the business situation since last month. Every indication points to the conclusion that the business readjustment of the last half of 1923 has been completed. Continued ease in the money market has enabled business to pass safely through this readjustment without danger of depression, and is now favorable to increased business activity and to the maintenance of firm or moderately rising commodity prices.

The iron and steel industry, which is about the best index of general prosperity, shows the beginning of what it is hoped will be a steady improvement.

In spite of the fading prospect of a coal strike, the price of coal remains firm.

Business, taken as a whole, should continue good for at least the next six months, and there are no present indications to suggest a change thereafter. There may be a decided expansion in the spring, just as a year ago, but at the present writing this seems unlikely. Business men still remember 1921, and their caution is reinforced by the unsettled condition of Europe and by the impending presidential election, especially in view of the oil investigation. These influences are favorable. They tend to restrain excessive activity, which might invite a reaction, but do not prevent a healthy development of production and distribution.

"If all the jaw power wasted by eleven years of talk could have been hitched to steam shovels, the Fourteenth Street Eastern and Nassau-Broad Street Liner would have been built long before this. —*"Look Ahead," Elevated Lines, New York City.*

Robert E. Mace

It is with a great deal of sorrow and regret that we announce the death of Robert E. Mace, who has held the position of purchasing agent of the Oliver Iron Mining Company since the United States Steel Company was organized in 1901.

Mr. Mace passed away at his home in Duluth on March 5th after a four months' illness, and was buried on March 7th.

Mr. Mace held the unique distinction of having, beyond question of doubt, placed more orders for excavating equipment during his career than any other known individual.

He was born in Montreal and came to the United States in 1883, when he took a position with the Marinette Iron Works, at Marinette, Wisconsin. He was later transferred by his company to Florence, Wisconsin.

In 1886 he became associated with Fred M. Prescott at Ironwood, Michigan, in the business of mining supplies and general hardware, and in 1899 took a position with the Oliver Company as purchasing agent with headquarters in Milwaukee. In 1901 Mr. Mace was transferred to Duluth as purchasing agent for the Oliver Iron Mining Company, which position he filled with distinction up to the time of his death.

Mr. Mace was admired and respected by all of those who knew him, and his name was well known throughout the industrial world as a purchasing agent of rare ability. He was a Scottish Rite Mason, a Knight Templar and Shriner. He was also a member of Kitchi Gammi Club and of the Duluth Chamber of Commerce.

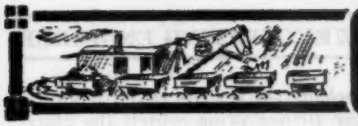
He is survived by three daughters, Clarissa, Bell and Edith, and a son Harry, a mining engineer in the employ of the Oliver Iron Mining Company located at Marble, Minnesota.

Bucyrus Company Appoints St. Paul Agent

The Bucyrus Company, South Milwaukee, Wisconsin, announces that it has appointed the Borchert-Ingersoll Company of St. Paul as its agent for the sale of small revolving shovels and dragline excavators for the states of Minnesota, North and South Dakota.

The Borchert-Ingersoll Company are well-known equipment dealers with offices in St. Paul and Duluth. Their St. Paul office is at 2540 University Avenue.

It is interesting to note that Russia has 70 inhabitants to every square mile of land, and 3 miles of railroad to every 10,000 people, while the United States has only 35 inhabitants to every square mile with 24 miles of railroad to every 10,000 people.



· FIELD NOTES ·

A Useful Pipe Chart

Copyright 1922 by W. F. SCHAPHORST

We often want to know the velocity of flow through a pipe of given diameter, and, we want to know quickly. Or, we want to know the cubic feet of liquid or gas flowing through the pipe per minute, the gallons per minute, or the pounds of water per minute.

All of these quantities are dependent, of course, upon the size of the pipe, and since pipe sizes vary, standard pipe not being exact in internal diameter, and extra heavy pipe being different also, it is always necessary to search through tables and make lengthy calculations before arriving at the results. Then, after a result is arrived at one is not certain that the answer is correct.

Here is a chart that takes care of all of these matters in a decidedly simple way. The best way to explain the use of the chart is to give a problem. First, it will be observed that there are three sets of figures given in connection with the left-hand column which I have called Column A. The left-hand column of figures, marked "No. 1 Standard," gives the actual internal diameters of standard pipe. This column shows, for example, that the internal diameter of a 1-inch standard pipe is somewhat greater than 1 inch.

The column of figures marked "2 Exact," gives the exact diameter. Thus, if we have a pipe the internal diameter of which is exactly 2 inches as used in the problem which is cited below, we use this column of figures.

The right-hand column of figures marked "3 Extra Heavy" gives the actual internal diameter of a 1-inch extra heavy pipe as less than 1 inch.

For example, how much water is passing through a pipe, the internal diameter being exactly 2 inches, and the velocity of the water being 2 feet per second?

Locate the 2 in Column A over the word "exact" and from its point of intersection run a straight line through the 2 feet per second in Column C as shown by the dotted line. This straight line intersects Column B. From the point of intersection in Column B, run a straight line over to the similar point of Column G, also as shown by the dotted line. The intersection of this perfectly horizontal line from Column B to Column G gives answers simultaneously in three columns — Columns D, E and F. It shows that:

2.6 cubic feet per minute are flowing through the pipe. (The correct amount is 2.615 cubic feet.)

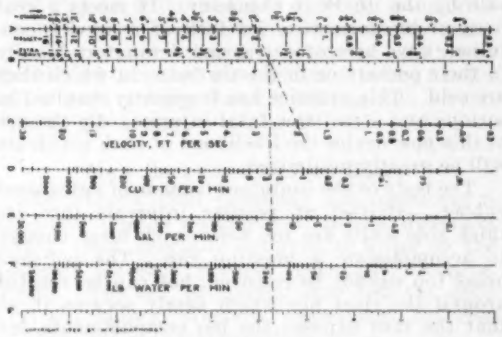
A trifle over 19 gallons per minute are flowing through the pipe. (The correct amount is 19.58 gallons.)

About 165 pounds of water per minute are flowing through the pipe. (The correct amount is 163 pounds.)

This shows that the chart is very accurate, surely accurate enough for all practical purposes.

It is evident, now, on studying the chart, that if the pipe were a 2-inch "standard" pipe instead of exactly 2 inches, the horizontal line from Column B to Column G would be slightly lower and the three quantities would be slightly greater.

On the other hand it is also evident that if a 2-inch extra heavy pipe were used instead of the 2-inch exact, the horizontal line from Column B to Column G would be raised slightly above its present position and the three quantities would therefore be slightly less.



Inversely, if any quantity in Column D, E or F is known and it is desired to determine the velocity per second flowing through the pipe, this same chart can be used with equal ease. First run the horizontal line from Column B to Column G through the known point, and then through the located intersection in Column B run a straight line from the known pipe diameter, and the intersection with Column C immediately gives the velocity in feet per second.

Or, if one wishes to select a pipe size, knowing any one of the quantities in D, E and F, and having decided upon the velocity of flow, it is perfectly evident what to do.

At the same time it will be noted that this chart can be conveniently used as a conversion chart. For example, how many gallons in 2.6 cubic feet? The dotted horizontal line already drawn shows that the answer is slightly over 19 gallons which is also equivalent to about 165 pounds of water. At the same time this chart gives a visual demonstration of the relationship of pipe sizes — standard, exact, and extra heavy. By using this chart one can quickly "read off" the

correct internal diameter of a standard or extra heavy pipe.

The range of this chart has been made great enough to take care of almost any problem dealing with water, the standard pipe sizes ranging from ⅛ inch to 15 inches and the velocities from 0.3 to 20 feet per second.

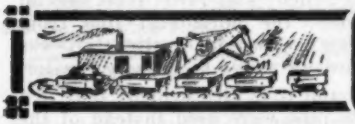
Should anybody prefer to use formulas rather than this chart, either for solving the problem directly or for checking the results taken from the chart, here are the formulas on which the chart is based:

$Q = 2.45\ d^2V$

Where Q = gallons per minute;
d = internal diameter inches;
V = velocity, feet per second.

Cubic feet per minute = $0.327\ d^2V$

Pounds water per minute = $20.4\ d^2V$



DEVICES YOU OUGHT TO KNOW ABOUT

A Practical Blasting Cap Container

Built like the cartridge chamber of a six-shooter, the new du Pont blasting cap container is the most recent blasting accessory offered for sale by the du Pont Company. It meets a real need of blasters who, for lack of a service container, have heretofore carried detonators loosely in their pockets or in the tin boxes in which they are sold. This practice has frequently resulted in serious and sometimes fatal injuries. By the use of this new device the likelihood of such accidents will be greatly minimized.

The body of the container is made of vulcanized rubber. Drilled at regular intervals into its thick side walls are ten holes, each large enough to accommodate a blasting cap. The polished brass top cannot be removed, but can be rotated around the rivet pin which firmly secures it, so that the vent exposes the ten compartments one at a time. You fill the container with blasting caps just as you would load a six-shooter with cartridges. After filling, the top can be turned so that the vent is effectually closed over a blind hole. Incidentally, this top is designed to prevent accidental turning, which is only one of its several safety features.

The legend — "Blasting Caps — Dangerous — Handle Carefully" — is embossed in white letters on the back of the container, along with the following safety rules:

Do not remove caps with wire or nail.
Don't tap or otherwise investigate them.
Don't carry caps loose in pocket.
Don't store in residence.
Don't smoke near caps.
Don't shoot into caps.

Attach caps to fuse with cap crimper, not with knife or teeth.

Keep in a dry place.
Keep open lights away.

Containers are made for No. 6 caps and for No. 8 caps. The retail price of each is 50 cents. Address inquiries and orders to the *Blasting Accessories Division of the du Pont Company, Wilmington, Delaware.*

New Type Riveting Hammer

The Ingersoll-Rand Company, 11 Broadway, New York City, has developed and is now offering a new type of pneumatic riveting hammer with many improved and economical features. This hammer has been thoroughly tested on all classes of work. It is now being sold only after having proved entirely satisfactory under all conditions.

The outstanding features of this new riveter include bolted construction for holding the handle to the barrel; heavy section valve with liberal bearing surfaces; combination poppet and piston type throttle valve; power in excess of all ordinary requirements; low air consumption and exceptionally easy operation.

The new style hammers are manufactured in three styles, A, B and C, and are available in a complete range of sizes from a 5-inch to a 9-inch stroke. Each size of this riveter can be purchased with any one of three types of barrels and with either outside or inside trigger handles.

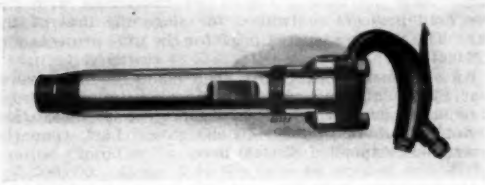
The standard "A" type has a barrel machined to accommodate a rivet set clip only, and is furnished on all orders which do not specify either a bridge type or retainer type barrel.

Three alloy steel bolts of substantial size, fitted with lock washers, hold the handle to the barrel. This is an exclusive feature of Ingersoll-Rand hammers, and enables them to be taken apart anywhere for inspection or cleaning with the aid of only a wrench; no vise, crowbar or other tools are necessary.

The throttle valve (except on inside trigger handles) is a combination of the piston and poppet types, having the nicety of control of the piston valve and the freedom from leakage of the poppet type. The beveled seat will remain tight throughout the life of the tool, preventing leakage. The throttle lever or trigger is made in one piece from special heat-treated spring steel and has a long bearing in the handle, making it capable of withstanding lots of abuse.

The valve is a sturdy sleeve made from special alloy steel. It has liberal bearing surfaces, and

its walls are free from holes or ports which so often are the starting points for checks or cracks. It operates in a valve box of strong construction, located in the head of the barrel. The valve box is constructed with a solid end, which enables it



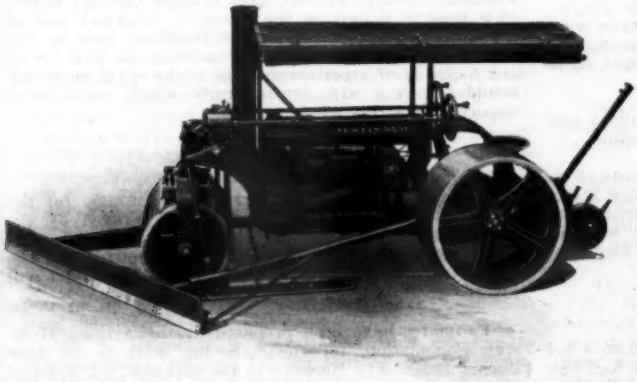
New Type Ingersoll-Rand Riveting Hammer

to be easily taken apart by the use of a piston for the removal of the valve, without recourse to the use of a screw driver or similar instrument with subsequent danger of injury. This construction also insures a compression chamber in the valve box which cushions the piston on the return stroke and prevents the piston from striking the handle.

They are fast, hard-hitting hammers, yet have less "kick-back" than usual, and consume less air. Due, primarily, to the bolted handle construction, they are lighter in the handle end, and consequently are better balanced and easier holding, especially when used in a horizontal or inverted position.

The Austin Pup

The Austin Pup, Road Maintainer and Roller, is the undoubted sensation of the road maintenance and construction fields. Exhibited for the first time at the 1923 Chicago Good Roads Show, where it attracted far more than its proportionate share of attention, it has proved itself to be the most valuable piece of all-around road machinery that has been brought into existence for many years; and has already become one of the most popular tools, not only among public officials and contractors of all classes but with parks, cemeteries and private estates, around manufacturing plants and filling stations, and, in fact, wherever there is need for a road maintainer, or a light, handy roller.



The Austin Pup, Road Maintainer and Roller

The reason for such immediate and universal popularity is apparent when the construction features of the Pup are understood. It combines characteristics never before found in a single machine, and as a consequence adapts itself to a surprisingly wide range of work, replacing cumbersome and much more costly equipment in most instances, and in all cases clearly surpassing former methods.

In a catalog recently published by The Austin Manufacturing Company, Wrigley Building, Chicago, Illinois, will be found typical photographs of the Pup on different kinds of work, along with letters from a representative few of the many enthusiastic users who testify to the all-around efficiency of this, the latest addition to the Austin line of road-making, earth-handling, and street-cleaning machinery.

New Cars for Handling Coal

The Penova Coal Company are operating a brand-new type of dump car at Adena, Jefferson County, Ohio, specially designed to order by the Western Wheeled Scraper Company, Aurora, Illinois. The car, of course, embodies the ordinary well-known Western mechanical features but there are many innovations.

It is a double-truck, one-way air-dump, self-righting car built on 36-inch gauge and has a capacity of 15 tons of coal. This is more than three times the capacity of the 4-yard dump car ordinarily used in handling coal in strip-mining. The door opening is ample for coal and the dumping angle is about 35 degrees, which reduces the breakage of coal. The car is built without side chains, the bed being held by automatic locks. Being a double-truck car it rides steadier than a single-truck car which reduces the loss of coal in transit.

The purpose of the management is to keep all men off the tipple. Two cars are spotted at a time on the trestle and are dumped by the man who directs the loading of the conveying belt from a platform below. After discharging its load each car rights itself.

The new design permits this car to be built at very low cost per ton capacity.

SHOTS FROM THE · FIRING LINE ·

Central States Notes

BY M. J. WOODHULL, J. J. GAULT, J. G. PARROTTE AND FRANK B. SMITH

The James E. McNamara Construction Company, Indianapolis, Indiana, have just been awarded the Kessler Boulevard contract in Indianapolis by the Board of Park Commissioners, at a price of $532,000. This is the largest boulevard improvement contract that has ever been let by the city, and involves the moving of approximately 150,000 cubic yards of dirt and the handling of about 60,000 tons of stone. The work will be completed this summer.

Tibbetts & Tibbetts of Olatho, Kansas, were low bidders on four miles of Missouri State Highway work at Jefferson City, February 23rd. The work is located across the river from Jefferson City, and will consist of 90,000 yards of earth excavation and 12,000 yards of rock. They have purchased a new Bucyrus 30-B Diesel shovel and will start on the work at once. Mr. J. W. Matthews, who up to a few months ago was connected with W. M. Spencer of Independence, Missouri, will have full charge of this work.

Norton Bros. of Kansas City have one of their shovels busy on a basement job at 12th and Main Streets, Kansas City, Missouri.

F. L. Busche of Omaha has completed the excavation for the new Knights of Columbus building at Omaha, Nebraska.

Spitcanfsky Bros. of Kansas City have most of their equipment on the job, and are going right ahead with the excavation for the new Kansas City waterworks.

New York and Vicinity

BY T. A. BURNS

There is no Clover Garden or other dance palace at Butler, New Jersey, which probably accounts for Jim Mannion's short stay with Kramer at that place.

Charles D. Beckwith, Inc., with the assistance of Mike Del Balso and his organization, have made a start on the extension of Riverside Drive and hope to complete it within the year. This is big work and we wish them every success.

P. H. Kearns is leaving today for Miami and is expected to return about March 16th. There is no reason why Mike Del Balso should be in town for the 17th.

Thomas Crimmins Company have about a year's work in excavating for the New York Edison Company at East 21st Street and Avenue "C." We understand Ryan and Davis expect to assist in this work.

Savefio Feraca took the fifty thousand dollars and rented Joe Desesa's new 20-B caterpillar machine.

James E. Gaffney is making considerable headway on the new Consolidated Telephone Building at 233rd Street and Kingsbridge Road. They have been fortunate in procuring big work all during Mr. Gaffney's business career. This job seems to be progressing about as smoothly as any we have ever seen.

Northwestern States Notes

BY A. R. HANCE, PORTLAND, OREGON

William J. Doust, of Spokane, Washington, with a bid of $116,103, was low for the 12 miles of county highway known as the Dishman-Mica Road, when four bids were recently submitted to the County Commissioners. This completes the $850,000 bonded road program for 1924 in the state of Washington, with the exception of a few small extensions which may be constructed after the county finds out how it comes out financially with the nine road projects contracted for since the first of the year. The total contracted price for the nine projects was $723,009.22.

An allotment has recently been made by the Government in the amount of $130,000 to continue the work this summer on the Randle-Lewis project in the eastern portion of Lewis County, Washington. Last year the Government expended $50,000 here.

Oregon gets $136,686 and Washington $85,741 for co-operative road and trail projects this year. Twenty-eight states in which national forests are located wholly or in part will share in the distribution during the current fiscal year of the $1,000,000 fund appropriated by Congress. This is an annual appropriation for the construction of roads and trails within the national forests in co-operation with local authorities.

That the Bloedel-Donavan Lumber Company of Bellingham, Washington, is preparing for construction of 18 miles of railroad to tap its timber holdings on the Olympic Peninsula, has developed with entry into the company's holdings of a contractor and crew.

Work on the new highway project, which is to link the principal towns of the Coeur d'Alene mining district with paved roads, has been temporarily delayed by the snow and bad weather, but will be pushed to completion, at least, to the point where the surface is to be laid, the coming season. The Idaho new roadway will cost $300,000, bonds for which were voted last summer by the citizens of Shoshone County. This is the first bond issue which the county has ever floated, and will be paid through the money formerly spent in the upkeep of the trunk line from Mullan to Kellogg through Wallace, a distance of approximately 20 miles. The County Commissioners have entered into a contract with the state highway department whereby after this stretch is brought to completion it will be maintained by the state as a state highway.

It appears that there will be about $75,000 available this year for work on the Whitefish-Eureka Road, Montana. The work will be done between Stryker and Radnor. The Forestry Department will furnish $60,000, Flathead County, $10,000, and Lincoln County, $5,000. This road is a part of the Roosevelt Highway and of the International Parks Scenic Highway, and is one of the worst sections of road in Montana that is on any highway of prominence. The highway, if improved, would attract a large tourist traffic which would be of importance to this whole section.

Pacific Coast News

BY P. H. BIRCKHEAD AND JACK SACKETT

A design for a gravity section type of dam for the Merced Irrigation District has been approved by the Federal Power Commission, Ferry Building, San Francisco. Final plans have not yet been completed, but the dam will probably be about 310 feet in height and will involve about 380,000 cubic yards of concrete.

Estimates have been prepared by the Arizona Highway Commission, for the following work to be done during 1924: (1) Buckeye to Hassayampa, 9.2 miles of 18-foot wide pavement; (2) Bisbee Tombstone Road,

2-inch asphalt concrete surface on existing base; (3) Old Trails Highway, as follows, 2.7 miles Winslow to Coconino County line — .5 mile from Topoc toward Oatman — 13.6 miles St. Johns-Springerville — 19.0 miles Seligman to Kingman; (4) Phoenix-Yuma Highway, as follows, 21.9 miles Piedra west to County line — 7.0 miles from Aztec to County Line — 5.0 miles from Gillespie Dam to Hassayampa; (5) 27.9 miles from White Spar to Congress Junction, on Phoenix-Wickenburg-Prescott Highway — 12.1 miles from Solomonville to Duncan on Central Highway — 16.0 miles Concho to St. Johns, the White Mountains — 14.0 miles from Legarde to Blaisdale — 3.0 miles from Oatman to Gold Roads; (6) Grading the following, 21.0 miles from Marionette to Hot Springs Junction on the Phoenix Wickenburg Road, 16.0 miles Chandler to Case Grande. Total estimated cost $3,900,000. Items 3 to 5 are to be graded and surfaced with gravel.

Appropriations have been made by the Bureau of Public Works for the expenditure of $285,948 for Arizona, to be used on the Clifton-Springville Highway, Prescott White Star Road, etc.

Engineers Martin Polk, of Chico, and J. D. McGregor, Chief Engineer of the Union Sugar Co., at Betteravia, have been appointed by the Santa Maria Irrigation Committee to prepare plans for a 50,000-acre irrigating system in Santa Barbara County.

Contract to Utah Construction Co., Phelan Building, San Francisco, for preparing Western Pacific Company roadbed between Wells and Winnemucca, Nevada.

Contract awarded to Sharp & Fellows Contracting Co., Central Building, Los Angeles, for the double-tracking of about 44 miles of railroad between Summit and Hicks, San Bernardino County. Work will involve 800,000 cubic yards of earth and heavy rock excavation. Estimated cost $2,500,000. This work will be for the Santa Fe-Union Pacific joint line.

Plans are being prepared by the Santa Fe Railroad Co., Kerckhoff Building, Los Angeles, for the construction of improvements to the railroad yards at Richmond, Contra Costa County. Work will involve new trackage, new approaches to the city, improvements to the wharving facilities, new shops, and the installation of new machinery in the shops. Total estimated cost $81,150,000.

M. Y. Luce has moved from Fairfield, Montana, where he was employed with the United States Reclamation Service, to Barahona, R. D., where he is now employed with the Barahona Company.

Southern States Notes

BY C. N. BALLENTINE AND W. W. WHORLEY

According to recent announcement by Mr. George Crawford, president of the Tennessee Coal & Iron Company, plans are being perfected for the installation of a new open-hearth furnace at Fairfield, Alabama, for the production of steel sheets. Four blast furnaces will be required to feed this mill. This installation, in connection with the new Air-Line Railway from Red Mountain to the Fairfield furnaces, will further increase the large developments under way in that district.

The Cherokee Rock Asphalt Company of Cherokee, Alabama, are making steady progress in opening up their new pit in Cherokee, Alabama. Mr. C. M. Colston is local manager.

Mr. S. Hamilton is operating a 20-B dragline in Weewahitchka, Florida, for the Florida State Highway Department.

Scott & Beardon, Sparta, Tennessee, were low bidders for the construction of seventeen miles of gravel road in Tishomingo County. This road will pass through Iuka, Mississippi, and will form a length in the Scenic Highway.

A. L. Dumas of Capleville, Tennessee, was awarded a nice road job in Starkville, Mississippi, on March 12th.

Luck Brothers, of Kansas City, are handling the excavation of the Bellvue Boulevard Underpass in Memphis with an Osgood 29. C. W. Long is handling the levers, assisted by Ernest Luck at the boiler.

Considerable interest has been caused among railroad contractors by the recent announcement of the Central of Georgia Railway of its intention to spend approximately five million dollars on improvement work along the main line between Birmingham and Columbus, Georgia; this will include a large amount of re-location and will shorten this distance by several miles.

Another Central Railroad project which is attracting considerable attention is the Illinois Cutoff from Kirkwood, Illinois, to Fulton, Kentucky, a distance of 169 miles. Considerable opposition to the new route was shown by those towns which would not be served. The Interstate Commerce Commission has recently approved for the second time the new location, and it is expected that construction will begin at an early date.

The recent passage by Congress of Mr. Ford's offer to develop the Muscle Shoals properties has been greeted with much enthusiasm by the people of North Alabama, and the three cities of Florence, Sheffield and Tuscumbia. The bill is now on its way to the Senate and in case it passes it is confidently expected that Mr. Ford will establish a large manufacturing center in the Muscle Shoals District.

St. Louis Items

BY A. B. KOENIG

C. F. Nagel, La Grange, Missouri, writes that he has finished his Government rock contract. He has a couple of good rock outfits idle that he would like to place on some work in this part of the country immediately.

C. R. Cummins was with us a day. Mr. Cummins reports his dragline work in Florida as progressing along nicely. He has sublet a part of it.

The Indiana Paving Company of Rochester, Indiana, was awarded the contract by the State Department of Public Works and Buildings for paving Section 16, Route 16, in Christian County, Illinois, extending from Rosemond southwest to the Montgomery County line, a distance of 3.45 miles. The contract price was $79,296.

Mulvill Bros., Shipman, Illinois, have two small grading jobs at Alton, Illinois, to sublet. One of these consists of about 4,000 yards and the other 10,000.

The Oliver Construction Co. of Little Rock started work on the million-dollar concrete highway, connecting Little Rock and Hot Springs, Arkansas. The contract calls for completion in 330 working days.

The Missouri Highway Commission has contracted with Woods Brothers Construction Co. of Lincoln, Nebraska, for one hundred thousand tons of sand and gravel which has been pumped from the Missouri River near Kansas City. The price is 20c a ton as the sand lies on the bank.

Canada

Montreal and Vicinity

BY J. M. WARD

The Provincial Department of Public Works of New Brunswick have just awarded contract to Kenneth McLaggan & Co. of North Devon, for the Upper Dorchester Bridge, consisting of 1 span of 183 feet and 4 spans of 164 feet each, stone-filled cribwork, stone and earth approaches, total length 1140 feet, at a price of $94,000.

The Dominion Government Department of Railways and Canals have received tenders for improving the north entrance to the St. Peter's Canal. The amount of deposit on this was $6500.

News from La Tuque, Quebec, is to the effect that the Dominion Public Works Department are contemplating a wharf on the west side of the river to cost $30,000, and that the Town Council contemplates a $50,000 power development.

The Dominion Public Works Department is receiving tenders for breakwater at Portuguese Cove, Nova Scotia. It is expected that this contract will be awarded in a few days.

The city of Grand Mere, Quebec, contemplates a $400,000 expenditure on sewer system during this year.

The city of Three Rivers contemplates an expenditure of $140,000 on concrete pavement this summer.

The Nova Scotia Power Commission, Halifax, Nova Scotia, are preparing plans for an intake dam, also a canal at Ruth Falls, Nova Scotia.

Mr. St. George Harvey of The Kennedy Construction Co. is on a holiday trip to the Continent. We saw a letter from him dated at Nice. He writes that he took a motor car drive of thirty miles, and was charged the sum of $4.00, and when he gave the chauffeur a fifty-cent tip in Canadian money he thought he would kiss him!

The Kennedy Construction Co. of Montreal have undertaken contract from the Canadian National Railways to furnish crushed rock for ballast between Montreal and Vaudreuil. It is rumored that the Canadian National Railways may proceed with a 35-mile railway line from a point in New Brunswick to Vanceboro, Maine. This project was killed last year in the Senate, but it is understood that a former regulation permits the railway to construct it without the permission of the Senate, if they so desire.

Toronto and Vicinity

BY N. DE WIND

Since writing our last notes the subcontracts on the Welland Canal, Section 8, have been disposed of by the general contractors, A. W. Robertson, Limited. The dredging work has been given to the C. S. Boone Dredging & Construction Co., Limited, of Toronto, and the dry excavation has gone to the Northern Construction Co., Limited, whose headquarters are at Winnipeg. We understand that both Robertson and the Northern Construction Co. will open offices shortly at Port Colborne.

The Ontario Highway Department, whose first road letting of the season was listed for March 18th, have announced as we go to press that the letting is postponed until the 25th. Many of the contractors have not been able to inspect the work on account of the exceptionally heavy snowfall during this past winter. This extra week will enable some of them to visit the site and check up their estimates.

Grading contractors and road-builders were much interested in the speech made by the Premier of Ontario, the Hon. Howard Ferguson, at the annual banquet of the Ontario Good Roads Association held in Toronto early in March. He made it pretty clear that the program for building pavement would be very much curtailed or cut off altogether during his term of office. At the same time he announced that the improvement of grades and the encouraging of townships and counties to extend their improvement of gravel and earth roads would be one of his leading policies. As there are about 75,000 miles of township and county roads to improve, whereas the Provincial Highway system had something less than 2,000 miles, road-builders need not despair of having work to do.

We had hoped to be able to announce by this time an agreement between the railroads and the City of Toronto on grade separation along the city's lakefront. Unfortunately it seems to be further away than ever, the city's attitude being more than ever to enforce the old pre-war agreement on raising tracks on a viaduct and the railroads are emphasizing more than ever the advantages and savings to be had by both sides by adopting their bridge plan, leaving the railroad grades where they are It is beginning to look as if another season must go by without this very necessary work being started.

Vancouver Notes

BY J. C. MOON

George Kidd, President of the British Columbia Electric Railway Co., Vancouver, British Columbia, announced that his company would spend $5,000,000 on its services this year. Included in this year's program is the building of the fifth unit at Stave Falls, costing $1,000,000, the initial work on the Alouette Lake project, costing $760,000, and a new gas plant with a capacity of 1,500,000 cubic feet a day, costing $376,000. The five millions will be spent on the mainland alone, stated Mr. Kidd, and in addition there will be required a considerable sum for the Vancouver Island system.

Hon. T. D. Pattulo, Minister of Lands for British Columbia, announced that a start will be made this year on the construction of a $10,000,000 pulp and paper plant near here. Frank P. Jones, president of the Canada Cement Co., Montreal, and Angus McLean, an eastern lumberman, head the Frazer Timber Syndicate which has conducted the negotiations with the provincial government in this regard.

The Esquimalt & Nanaimo Railway Co. will apply to the Dominion Parliament at its next session for an act extending the time for the completion of the branches from Port Alberni via Great Central Lake to Comox Lake, and from Sproat Lake to Long Beach on the west coast of the Island.

Estimates approximating $18,000,000 for harbor developments at Vancouver, British Columbia, commencing this year, are to be taken to Ottawa for approval by the government by Lieutenant Colonel Kirkpatrick, president of the Harbor Commission.

Spillers, Limited, large English milling firm, which has set aside $15,000,000 for its share in the development of the western grain route, is preparing to spend upwards of $2,500,000 on a grain elevator in Vancouver, British Columbia.

Winnipeg and Vicinity

BY F. X. AMOS

The Lake of the Woods Milling Company, through N. J. Breen, Western Manager of the Company, Thursday announced its construction program for the spring season. This will include a new elevator and workhouse at Keewatin, Ontario, which will cost around $125,000. The plans are being completed by C. D. Howe Engineering Company at Port Arthur, Ontario.

A second proposition is the addition to the milling plant of the company at Medicine Hat, Alberta, which will double the capacity and will consist of a two-story addition to the warehouse 100 by 60 feet and a 100,000-bushel addition to the elevator to consist of concrete grain tanks. Bennett & White, of Calgary, have been awarded the contract for the work at Medicine Hat. The storage capacity of the elevator will be 250,000 bushels when the new work has been completed. The work will involve the sum of $100,000. The work at Medicine Hat has already commenced, and will start at Keewatin before the first of April, and will be completed in both places before the first of August.

The railway service, especially the Canadian Pacific Railway in the West, has suffered a great loss in the death of Mr. James Manson, Assistant Vice-President at Montreal, who died Friday evening, March 7th. Mr. Manson was in good health and in the office the day he died. In the evening he had hemorrhage of the brain and died suddenly. Mr. Manson was an old-timer in the West, coming here in 1883, and, while he has been in Montreal in recent years, has never lost his interest in Western affairs. Mr. Manson was a real friend and advisor to all the boys in the Canadian Pacific service, and his broadmindedness and kind-hearted interest in the individual has been a wonderful factor in maintaining the splendid morale which has always existed among the officers and employees of the Canadian Pacific Railway. Those who have been associated with the late Mr. Manson on the Canadian Pacific and who have since left the service of that Company, and their number is great, feel the loss they have suffered in Mr. Manson's death as keenly as his fellow officers.

The rehabilitation of that part of the Hudson Bay Railway constructed some years ago will be undertaken just as soon as weather conditions permit, according to a statement made here by A. E. Warren, General Manager, Western Region, Canadian National Railways.

An appropriation was made for this by the Federal Government last year, but owing to the lateness of the season little work was accomplished. The line, which has been little used, deteriorated badly, and it is understood that much work will be necessary to put it in shape again.

Mr. Warren said he had been instructed by Hon. Geo. P. Graham, Minister of Railways and Canals, to proceed "full speed ahead" on the Hudson Bay Railway. He left here today on an inspection trip of the line, in order to plan for immediate work, just as soon as the frost will permit.

TRADE NOTES

Sales of motor trucks during the first two months of 1924 by the General Motors Truck Company have exceeded all previous records for the same period, Vance H. Day, General Sales Manager, reports. The demand has been so great that the company has more unfilled orders on hand than it ever did in any previous March.

"The total number of orders received by General Motors Truck Company during January and February this year was 21 per cent greater than orders during the same two months in any preceding year," said Mr. Day. "From the present trend of business this should prove the greatest year the truck industry ever has known.

"Improved business conditions, greater use of motor trucks in all lines of industry, and the elimination of discarded war equipment by the government from competition, are three sound reasons why truck sales in 1924 should break records."

Mr. Day also announces the opening of a new factory branch in Cleveland to take care of the rapidly expanding business in that territory. The branch has 20,000 square feet of floor space, and is equipped with everything necessary for the servicing of GMC trucks. O. W. Crawshaw, District Sales Manager, is in charge of the branch.

Blaw-Knox Makes Changes in Personell

Robert T. Harris, who has been located at the New York office, has been transferred to Baltimore as District Sales Manager for all the products of the Blaw-Knox Company.

Walter H. Duncan, formerly Field Engineer for John F. Casey Company, contractors, has joined the sales staff of the Road Equipment Department of Blaw-Knox Company.

William F. Glasser, formerly engineer in the Heavy Forms Department of the Blaw-Knox Company, has been promoted to Assistant Chief Engineer of the department.

Charles K. Wehn, formerly located at the company's Chicago office, has been transferred to the Pittsburgh office, as District Manager of the Standard Steel Building Department at Pittsburgh.

R. D. Spradling, who has been located at the Baltimore office, has been made District Manager of the Standard Building Department at Chicago.

Dan W. Healy remains at the New York office in the capacity of District Sales Manager of the Standard Building Department in New York.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

The T. L. Smith Company, Milwaukee, Wisconsin, is distributing its 1924 PAVER CATALOG. It contains complete descriptions of the Smith Paver models and their outstanding features, together with many half and full-page illustrations of Smith Pavers "in action." This year's catalog is especially attractive, being printed in three colors throughout, and having an extra strong binding.

ELEMENTARY HYDRAULICS — By F. W. Medaugh, Instructor, Civil Engineering, Johns Hopkins University, has recently been published by the *Van Nostrand Company, New York.* It contains a valuable introduction to a course in hydraulics and should be of value to anyone interested in hydro-mechanics. The subject is dealt with by means of an introduction, and followed by chapters on Pressures and Surfaces, Immersed and Floating Bodies, Measurements of Pressures, Flow Through Pipes of Uniform Section, Friction Loss in Pipes, The Venturi Meter, Effect on Flow of Changes in Direction, The Pitot Tube, Orifices, Weirs, For Tubes and Nozzles Flow in Open Channels, and Hydro-Dynamics. The book contains 71 interesting illustrations, and is cloth bound, with 144 pages of interesting reading.

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The complete story of how *Cyclone Drills make hard rock "soft"* is told in our 100-page catalog B-45 entitled "Big Blast Hole Drills." Ask for a copy.

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Vol. 18 | MILWAUKEE, MAY 1924 | No. 5

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THE EXCAVATING ENGINEER PUBLISHING COMPANY

BRADLEE VAN BRUNT, Manager and Editor

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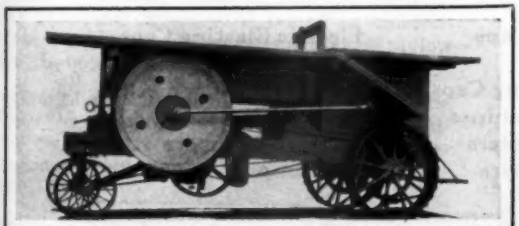

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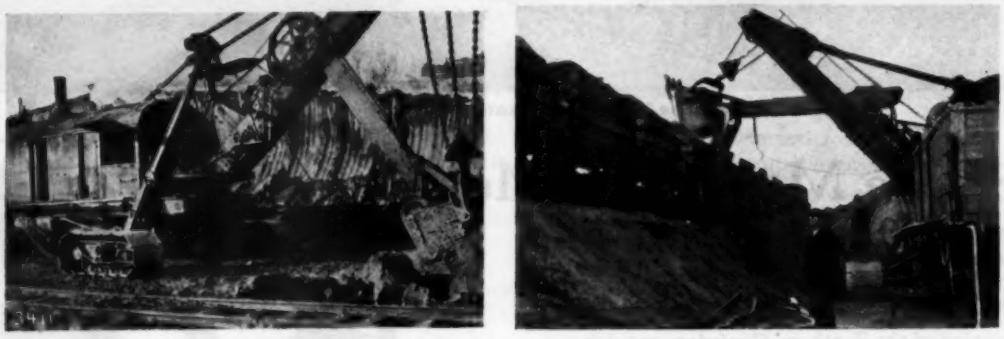
The above two views show a Bucyrus 50-B, equipped as a shovel at the left and as a dragline at the right. It was first installed as a dragline for shaping up cuts and later as a shovel in the heavier work.



During the winter and early spring, when drizzling rains and snows kept the floor of the pit wet and soggy, caterpillar traction made the work far simpler for the railroad-type shovel. The shovel is a 70-C Bucyrus. E. J. Slane is seen in the foreground, while the man perched up on the caterpillar is J. P. Dougherty giving us the once over.

A rear view of one of the Bucyrus 70-C railroad-type shovels on caterpillars. There are two of these machines on the work, in addition to one on railroad trucks. Another will be added some time this month which will be mounted on caterpillars also.

Views of Shovel Operation on Chicago, Burlington & Quincy Railroad Cut-off Between Frederick and Vermont, Ill.